

Inf  
Inaugural Dissertation  
upon the  
Introduction of Foreign Substances  
into the Bloodvessels.

by  
Edward Jenner Cox. Philad.

admitted March 3d. 1823 -

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In the present age when it is almost if not entirely impossible to mention a subject which has not engaged the attention of some of the brightest ornaments of that art, which has been the means of restoring an incalculable number of our fellow beings, to their families, their friends, & the world, & to add still more convincing proofs of the existence of that Supreme Being, without whose assistance no art could flourish, nor any undertaking succeed.

When we see the difficulties arising from the introduction of a new medicine in the treatment of any particular disease, although recommended by men of acknowledged talents, long experience, extensive practice, & mature years, how impossible is it for a young man to have that experience, which alone should authorize a Physician to proclaim to the medical world, that this medicine possesses such properties, or that it is useful in this or that disease? Have I undertaken to write a dissertation upon any particular

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disease, what could I have said about the causes, symptoms, or treatment of that disease, that would have been either new, or interesting.

Considering it in this light, I have determined that the subject of my inaugural dissertation shall be upon the introduction of foreign substances into the blood vessels of living animals.

We will in the first place prove that this subject occupied the attention of some learned men, upwards of a century ago, & that, notwithstanding the positive denials of some of the present day, as to the possibility of introducing any substance into the blood, without producing death, the result of a majority of their experiments, proves that the most acrid & deleterious substances, have been thrown into the blood without any injurious effects arising therefrom, & that in a number of cases this has been resorted to as a means of cure, & with the greatest success.

We will in the next place endeavour to apply it to the cure of some of the most violent diseases, by which the human frame is liable to be attacked.

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Dr. George Baglivi professor of Physick & Anatomy at Rome, when speaking of the impropriety of reasoning always from an analogy, says that those reason correctly, who conclude that the observations made from experimenting upon living animals, can be justly applied to the human frame so far to what do we owe the discovery of the Circulation of the blood, the structure of the viscera, & many other important facts, but to those experiments, & the accuracy of the reasoning deduced from them.

In his dissertation upon the use & abuse of blistering plaisters, he performed several experiments upon Dogs, by introducing the Juice of Cantharides into their Jugular veins. The experiments are given in the words of his translator.

Rome May 1692 "I tyed a mastiff dog upon a table, opened his right jugular vein & injected with a syringe two ounces of the Tr of Cantharides, which I had made by taking two drachms of the powder of Cantharides, to six ounces of the water of Annus Benedictus, & digesting them three days upon ashes. Upon the beginning of the injection, the dog vomited watery & slimy matter, & voided at

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mouth a viscid sort of spittle, till I had finished the injection of two ounces, & sewed up the wound, & sprinkled it with burnt vitriol. This operation was no sooner over than he fell down, as if he had been dead. He refused to eat to the last minute of his life, & was extreme thirsty, in so much that my servant moved ~~without~~ <sup>with</sup> compulsion gave him without my knowledge, about 6 quarts of water, which he drank & presently voided a great quantity of yellow urine. In the mean time he howled, & continued miserably thirsty, but we gave him no more water. Before his death he was seized with convulsions. He died after miserable howlings, the Fourth day at night."

"Having opened his carcass, I found that part of the neck upon which we had made the experiment, was perfectly mortified & fetid. In the right ventricle of the heart, the blood was very black & copious, with little or no coagulation, & some drops of oil as I saw upon the surface. We found there a small polypus continuous to a clot of blood. In the left ventricle of the heart we found two little polypus, & the blood dissolved, but extreme black.

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The Lungs & the other viscera were sound. In the renal bladder we found not the least bit of that stinky matter, that naturally gnaws the inside of it: perhaps the acrimony of the Cauterisers had gnawed it off. The Gall in the gall bladder was somewhat black. The blood that oozed out upon the cutting of the veins of the viscera, was very black without any coagulation, & covered with little drops like oil on the surface."

Do we not know that the application of blisters, more commonly produces Strangury, & thirst. & that consequently delivents are resorted to, in order to relieve the painful sensations, arising from that Strangury. Does not this go far to prove, that the same results arise from the external application of, & the introduction of the *str* of Cauterisers into the blood. On examining the appearance upon dissection, we find a very good cause for the death of the dog, independent of the quantity introduced, & acting in *im loco*. That part of the neck where the incisions were made, was found to be entirely mortified, & fœtid.

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must have supervened, whether from the irritating quality, of the substance employed, or from the violence of the Operation. It can not be supposed that inflammation could have existed in this part, without extending its influence; & proceeding either upwards, until it reaches the Brain, or downwards, until the Heart became affected.

Have we not in either case, a most violent disease to contend with? & when either of them do occur, is not the Amputation more frequently fatal?

Exp. 2<sup>d</sup> "I tyed down upon a table, a young & indifferent big dog, & injected into his right jugular vein, two ounces of the Tr of Cantharides. The wound was no sooner sewed up & dressed as above, than the dog vomited & fell down half dead. Two hours after he held out his Tongue for thirst, with a great deal of anxiety, but I allowed him no water. He was extremely thirsty, but would not eat. Six hours after, he expired with grievous howlings." "Having opened his Carcass I found all the viscera sound, but the blood was very black, & dissolved, & covered in the surface with little drops like oil. The dog being young, & not very big, & no water

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being allowed him, the humors were soon dissolved, & melted down by the caustic salt of the Cantharides, so that he died in six hours. In this experiment although the same quantity of the It was used as in the former, it terminated fatally in 6 hours. To what cause could this be owing, except to the deprivation of the liquor, which he so much craved? Did not the water act by collecting the blood, & enabling the Cantharides to pass off more readily by urine? Unless some mild diluent is taken judiciously, the action of the Cantharides overpowers the natural action of the Kidneys, thereby preventing the free secretion of urine & via a putation upon the use & abuse of blistering plasters, page 377

1715 About ten years ago, I took a great dog at Naples in the month of July, & opening his jugular vein in the afternoon, I injected into it with a syringe, half an ounce of the spirit of vitriol. As soon as I had closed & swathed up the wound, the dog was seized with a shivering & shaking; he vomited, & threw out great plenty of spittle; he fell down upon the ground, was breathless & somewhat touched with convulsions, after a few hours he died.

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62 I incised the right crural vein of a young dog near the groin, & infused with a syringe two ounces of rectified spirit of wine. after the injection the dog shivered & shook all over for half a quarter of an hour; then he voided urine in great plenty, & was well as to all the functions of life. The termination of this experiment proves most positively that foreign substances can be introduced into the blood vessels of a living animal without producing death.

63 "Having tied a young dog down upon a table, I opened his right jugular & infused two ounces of the rectified spirit of wine, but the injection was scarce over when the dog expired". In cutting up his carcass, I found the blood very much clotted & coagulated in the Lungs, but all the other parts were sound.

The distance that the spirit of wine had to go before it reached the heart, when introduced into the crural vein, the continual motion of it, & its particles in consequence of that motion being separate, all tended in a great degree to destroy the coagulating virtue of that article, which coagulation in the last experiment, no doubt

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by preventing the free circulation of the blood through the lungs, caused the death of the dog.

Exp. In the beginning of 1891, I laid open at Padua the jugular vein of a young dog, & injected with a syringe, four ounces of cold water. After the injection was over, & the wound done up, the dog was seized with an universal shivering & shaking, but he lived & did well.  
 See disputation 3<sup>rd</sup> exp. 1, 2, 3, 4. pages 412, 13, 15.

D<sup>r</sup> Bauard Huetta in his chapter de Infusione, says  
 "Medicamenta subinde vasis infunduntur, uti ab antiquis traditum est, ex quo fit, ut effectus suos paulo maturius edant. In actis Philosophicis, 2049. Some fecit de milite, cui medicamentum catharticum venis infundebatur, quod pro voto operabatur, nodumque auferbat. Emellerus ait Catharticum Pandisci injectum fuisse, quod ex Kammonii gravis septem, soluti in essentia quassiae thachonis tribus constabat. Johannes Polus laudat opiatum in porrigilio injectum. Salium volatitium, in Cataplectici injectionem. Salium volatitium, opio mixturatum in epilepsia injectionem. Tincturam maris,

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*rustici cujusdam venis cum eventu prospero in  
melancholia immisit. Antiparalytica in paraly-  
si folia injecta est.* *Vide Pharmacopoeia praecepta per Boerhaave  
Strohm. M.D. oct 6 ac Imperium page 434.*

In Bich's history of the royal society, vol 2<sup>nd</sup>, May 17<sup>th</sup> year 1665,  
page 28 are the following.

Essence oil of Tobacco, was injected into the vein of a  
dog's leg, without producing any effect upon him  
vol 2<sup>nd</sup>, May 24<sup>th</sup> year 1665, page 60.

Eight a nine drops of spirit of Tobacco, were injected into  
the vein of a dog, with the effect of producing at first  
sickness, & followed by vomiting.

In Allston's lectures on Mat. Med. vol 1, lecture 7, page 38.

He mentions, that Boerhaave, & some others say, that oilum  
a spiritus Sulphuris, may be injected to the quantity  
of one a two drachms into the veins of a living dog,  
without hurting him. The only remark made by the  
Doxa upon this assertion is, "Sed multum dubito."

In the Philosophical transactions abridged by John  
Lowthorp, vol 3<sup>rd</sup> page 277 by the following experiment

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are received. I Trocassati professor of anatomy, at Pisa in Italy, having infused into the jugular & Cerebral vein of a dog, some aqua fortis diluted, the animal died presently, & being opened, all the blood in the vessels was fixed, but that in the guts not so well. The author from the above experiment makes the following reflections. 1<sup>st</sup> That an Apoplexy being often caused by a like coagulation of the blood, (as hath been observed by the opening made of sundry persons who died of that distemper) it might be cured by a timely infusing some dissolvent into the veins. 2<sup>nd</sup> That it is likely that that useful secret, by which Mr. De Bills dissected animals without any effusion of blood, consists in some such infusion.

527. Some oil of Sulphur was injected into the veins of a dog; but he did not die of it, though the experiment was tried several times upon him. The wound being closed, & the dog let go, he went into all the corners of the room, searching for meat, & having found some bones, he fell gnawing them with a strange avidity, as if this liquor had caused in him a great appetite.

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Dr. Fabricius injected about two drachms of a laxative medicine into the median vein of the right arm of three patients in the Hospital at Dantzick. One of the patients was a lusty robust soldier, dangerously infected with the venereal disease & suffering grievous protuberances of the bones in his arms. He complained of great pain in his elbows, but the medicine began to operate in about four hours, & continued working till the next day. The man had five good stools after it. Without any other remedies, these protuberances were gone, nor are there any footsteps left of the above mentioned disease. The two other trials were made upon the other sex.

A married woman, & a serving maid about 20 years of age. Both had been affected with Epileptick fits from their birth, & there appeared no hopes of curing them. A laxative resin dissolved in an Antiepileptick spirit, was injected into the veins of each. The first of them had gentle stools, some hours after the injection, & the next day the fits recurring now & then, but much milder, as since altogether vanished. The maid had four stools, the first

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day, & several the day after, but, by going into the air & taking  
 cold, & not observing any diet, she cast herself away.

Mr Smith hath adventured to open a vein & infuse some  
 medicines into the blood of two persons in the hospital  
 at Wantzick, desperately infected with the Pox, whom of  
 the one recovered, & the other died. The same Physician to-  
 gether with M. Schoffele repeated the experiment, by in-  
 fusing alluring medicines into the veins of the right arms  
 of three persons: the one lame of the Foot, the other ex-  
 tremely apoplectical, & the third reduced to extremity by  
 that odd distemper, the Plica Polonica. The success of this  
 as M. Hovelius (who was the only person admitted to be  
 present at the operation) informs me was, that the Footy  
 man found himself pretty well the next day, & shortly  
 after went to work, it being harvest time, & has continued  
 well ever since, leaving the Hospital Aug. 17<sup>th</sup> 1668, & pro-  
 fessing himself cured. The Apoplectical hath not had one  
 paroxysm since, & the several sores which the Plica Polonica  
 had occasioned, are healed, & both these persons are  
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In autumn 1890 I (Dr. A. Martin) injected into the jugular vein of a dog half an ounce of crude mercury, & observed the dog soon after to have a dry short cough, which by intervals seized him. about two days after, I found him troubled with a great difficulty of breathing, & making a noise like that of a broken winded horse. The fourth day after the injection of the mercury he died. —

In Haller's Physiology vol. 2<sup>nd</sup> Sect. 2<sup>nd</sup> § 25, pages 76, 7, & we find the following *In venas vivi animalis datum a lias, non nocuit; alias animal post, cum infusionem, extinctum fuit, sive id acuti culpa factum, est; sive casus vim suam, exseruit. Spiritus vituli debiles & aluminis liquor sanguinem nondum coagunt, & potius diluere videtur, & in venam injectis, spiritus, salis dilutus, & aqua regia debilis animal non occidit; alias forte non salis dilutus, & ipse & sulphuris per campanam, paratum, oleum animal necant.*

In the Philosophical works of the honourable Robert Boyle Esq. by Peter Shaw Esq. part 2<sup>nd</sup> Sect. 2<sup>nd</sup> page 38 we find the following experiments. I (Mr. Christopher Wren) procured a large

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dog, into the vein of whose hinder leg, we conveyed by a syringe a small dose of a warm solution of Opium in Sack. The effects, which became manifest as soon as we could loose the dog from the cords, wherein with his feet was tied, for he immediately began to nod & reel as he walked; whereupon to preserve his life, I ordered him to be kept awake by whipping, which after some time brought him to himself; so that he soon grew fat upon it. See note at page 38 of the same Book for the following

- 14 Having injected into the jugular vein of a dog two ounces & a half of the panacea of Opium, the dog expired in four minutes, not differing in his limbs
- 15 Two ounces of spirit of wine, were injected into the jugular vein of a dog, which terminated fatally in a short time.
- 16 Six drachms of spirit of sal armoniac prepared with quick lime being injected into the jugular vein of a dog, he was within a quarter of an hour convulsed over his whole body. The crural vein being first opened & next the jugular, the blood that ran out was very fluid & thin, & smell strong of the urine over spirit & appeared full of bubbles of air. soon after half an ounce more of the spirit was injected, & the dog expired.

17 An ounce & a half of a strong decoction of the Peruvian Bark, was

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injected into the jugular vein of a dog. In a quarter of an hour, he was taken with a strong & frequent pulsation of the heart & afterwards with convulsive twitchings. Half an ounce more being injected, he died convulsed.

The above experiments, with several others, were performed by P. Fourn in order to shew the manifest alteration, that different medicines would cause in the blood. Where death has ensued, we may reasonably if not to a certainty conclude that the great quantity of the substance employed was the cause, as Mr John Hunter has stated in his experiments.

In the manuscript lectures of John Hunter, a man whose authority is no where more highly estimated than in this University, which renders it the more surprising that his experiments have been overlooked. In his Chapter on the humor, he says, "Foreign matter does or does not disturb the body, but it cannot produce any permanent effects, & as many medicines enter the blood they may be considered as coming under the description of extraneous matter."

With a view of ascertaining the operation of some medicines when introduced into the blood, he made the following experiments.

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- 1<sup>st</sup> A weak solution of sea salt was thrown into the vessels of a dog, without producing any apparent change.
- 2<sup>nd</sup> Two Ounces of Potash dissolved in an ounce of water, was injected with the same effect.
- 3<sup>rd</sup> Equal quantities of vinegar & water, thrown into the circulation of a bitch with young produced miscarriage.
- 4<sup>th</sup> Nitrolic acid diluted to the strength of vinegar in similar circumstances, had no effect.

From these experiments Mr Hunter remarks, that it appears that very powerful medicines may be present in the blood, without any visible effect. But there are other substances with which animals may be killed; these however produce no permanent effects, but may be referred to local operation, for the action will only continue while the cause remains, for example.

- 5<sup>th</sup> A strong solution of opium was thrown into the cranial vein of a dog, & occasioned violent convulsions. Upon more being thrown in he lost the use of his limbs, became quiet, breathing very laborious, & quick, with increased action of the Heart & arteries. Two injections of Fir introduced

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into his circulation produced great relaxation. The dog became quiet for an hour & gradually recovered.

8<sup>th</sup> Two ounces of Laurel water occasioned convulsions, his legs were drawn up to his body & contracted, but he afterwards recovered.

9<sup>th</sup> Five grains of Spicacuanha thrown into the veins of a dog caused instantaneous sickness which continued near an hour. The sickness was so immediate that it could scarce have reached the heart. An injection of two ounces of water containing two grains of Salap soon vomited him succeeded by fullings & evacuations with several stools, after which he was perfectly well.

10<sup>th</sup> An infusion of Rue bark had no other effect than urging the urine.

11<sup>th</sup> Ether produced immediate death.

12<sup>th</sup> Common vinegar had the same effect.

13<sup>th</sup> Diluted Nitric Acid distended him very much, but did not kill.

14<sup>th</sup> An introduction of destroyed animals.

15<sup>th</sup> The serum of a pustula vesicle in a pustular fever was injected into the vein of a bitch. It produced vomiting, but she recovered.

Mr John Hunter says that when extraneous matter introduced into the blood produces death, it seems to be from the

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quantity introduced being too great for the vessels.  
 From the result of these experiments it appears scarcely possi-  
 ble that a doubt can be raised by the most sceptical concu-  
 ring the practicability of injecting foreign substances into  
 the blood, without proving destruction to life.  
 That great care was taken in the performance of these  
 experiments, & that accurate statement has been given of  
 them, it need only be recollected that it was John Hunter  
 who performed them.

In the inaugural dissertation of Dr. Adam Sybert (a gradu-  
 ate in this University; page 45 & 46) are the following experiments.

- 1<sup>st</sup> About five drams of putrid serum was injected into the  
 femoral vein of a bitch. After the injection was finished, she  
 was placed on the floor & attempted to walk, but was so  
 weak that she fell down. In an hour & a half after the ex-  
 periment was performed she appeared motionless, & a short  
 time afterwards she died.
- 2<sup>nd</sup> A dram of pus diluted with a little clean water, produced death  
 in an hour & a half.
- 3<sup>rd</sup> A dram of flava matter produced by highly putrid beef diluted

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with four drams of putrid pump water, produced death in eleven hours & a half.

Twelve grains of putrid blood diluted with a dram of clear pump water, produced death in twenty hours.

Six grains of putrid blood in a dram & a half of clear pump water, were injected into the femoral vein of a bitch. 24 hours after she appeared perfectly easy, & on the day following she was perfectly well.

12 grains of putrid blood in a dram & a half of clear pump water, were injected into the humeral vein of the bitch last mentioned. Two days after the experiment she was perfectly well.

Half a dram of putrid blood & a dram of clear pump water, were injected into the humeral vein of the last mentioned bitch. She was perfectly well 21 hours after the injection.

45 grains of mild volatile Alkali dissolved in two drams & a half of clear pump water, were injected into the femoral vein of a Bitch. She was perfectly well 48 hours after the injection.

It was the intention of Dr. Sybat to dispose by these experiments

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the possibility of the blood of a living animal becoming putrid; & for this purpose putrid substances, were selected to inject into the veins, as offering the greatest hopes of rendering the blood putrid, if such a thing had been possible. The results of his experiments as is already well known entirely overthrow any theoretical opinions, that might be disseminated by those holding an opposite doctrine.

A singular mode of producing vomiting, for the expulsion of solid food sticking in the Oesophagus, & threatening suffocation, has been proposed & practised by one or two German Practitioners, & as is said with complete success. Four grains of Tartar. Emetic were dissolved in half an ounce of warm water & injected by means of a syringe, with a long tube into the median vein of the arm. In about a minute, the Patient vomited violently, & discharged the obstructing substance, which before was in vain attempted to be dislodged.

(Vide Medical & Surgical review, vol. 12. & 13 page 32 of miscellaneous for 1805)  
The conductors of the 'Dictionnaire des Sciences médicales', at Paris vol. 23, page 26 & 27, under the head of Infusion thus speak of it: "Mais il est des cas, où le métron après avoir effusé"

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sans fruit toutes les ressources de l'art, reste l'opération oisive  
d'une mort, que rien ne peut plus empêcher; pour qu'on,  
alors, n'aurait-il pas recours à un moyen extrême qui sans  
ajouter au danger, peut faire encore briller une lueur d'es-  
pérance? et quand il n'arracherait qu'une victime à la  
mort, cela suffirait pour s'en faire un avantage.

Apendant le docteur Schmidt de Danzig, répéta en 1668,  
les expériences de l'infusion dans les veines, et on obtint des  
succès, contre l'épilepsie, la Syphilis, et la Goutte.

Leubkehaus a publié dans les journaux de Göttingue, des  
des succès, dus aussi à la même méthode. Tabernicus en  
1668, et Sprengel en 1753, ont fait beaucoup d'expériences  
sur l'infusion dans les veines jugulaires.

Mathieu Boesjovius Burmann se fit une première fois  
cette opération en 1693, pour se délivrer d'une gale opiniâtre.  
A une seconde fois pour se guérir d'une fièvre intermittente  
chronique. On ignore quels sont les fluides qu'il s'infusa.

Liebkühn et Sarsche, en 1770, infusaient avec le plus grand  
succès, les substances émétiques, et Purgatives, dans les veines, et  
le docteur Hahle, ayant assisté à ces expériences, fut recueilli

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un jour à l'infusion de ses graines, de Tartrate Antimonie  
de Potasse, pour opérer le vomissement, chez un soldat dans  
l'œsophage duquel un morceau du tesson de baquet était  
enfilé, sans qu'on eût pu en faire l'extraction, ni faire agir  
le vomitif dans l'estomac. Schmucler eut aussi eu  
le même succès, dans une circonstance absolument pareille.  
Hermann, Médecin allemand, grand partisan de l'infusion, a  
souvent répété, en 1773, les expériences de Hobbler, et a obtenu, avec  
des résultats, non moins heureux que les leurs.

Une demoiselle avait un épistaxis, qu'on voulut arrêter par  
l'effusion d'eau froide sur la tête. L'épilepsie en ayant été  
la suite, Hermann prit le parti d'infuser une once la fois de la  
solution. D'undemi gros de muse, dans six onces d'eau, ce qui  
procure une guérison complète. Une autre maladie, affectée d'une  
fièvre putride qui l'avait réduit, à la dernière extrémité, fut  
aussi sauvée par cette méthode. Le même médecin lui infusa  
trois onces, d'une forte teinture de quinquina, animée d'un peu  
d'esprit de corne de cerf; il y eut au moins le soulagement,  
mais le danger recommençant, on décida la cure en infusant  
dans la veine une dose <sup>sauf</sup> essentielle, et d'opiat de quinquina.

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Cette l'ingestion de ces substances, n'aurait pas eu le même résultat. Les Perses, et les Indois, ont familièrement recours à l'infusion dans leur médecine vétérinaire, et ils en obtiennent des succès. On sait que les ruminans, ayant quatre estomacs, il est difficile de les piquer. Les chevaux ne sont piqués qu'au bout de vingt quatre heures, tandis qu'on peut obtenir, en peu d'instans, cet effet de l'infusion.

L'Esprit aqueux d'opium, introduit à petites doses, par les veines crémaléon médiane, présente moins de dangers que de chances favorables. Nous l'avons essayé sept fois contre le tétanos traumatique; il y a trois ans, et nous avons incontestablement sauvé trois malades. Ces expériences ont été faites publiquement, et de l'aveu des officiers de santé russes, sur des soldats de cette nation, à l'hôpital de l'Etat, loi, établi à Minimontant. Antérieurement nous avions fait un bien plus grand nombre d'essais, qui avaient été encore plus heureux, puis que la proportion des guérisons avait été de cinq sur huit: et quel est celui des moyens qu'on a successivement vantés, et employés contre ce redoutable et mortel accident, qui ait eu des succès aussi remarquables,

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L'infusion est un moyen curatif si utile, qu'on a à regretter de le voir si rarement employé. C'est surtout dans les cas, où il faut recueillir la nature opprimée, dans les asphyxies, l'hydrophobie, etc. à la suite de l'empoisonnement, lorsque le spasme tétanique s'oppose invinciblement à l'ouverture de la bouche, et que la déglutition est impossible, même en introduisant les médicaments à travers les incisives scissalablement enlevées, et qu'il faut obtenir le prompt renouveau des matières ingérées, le seul moyen d'y parvenir serait d'insérer un émétique par la veine.

Dans une peste qui menace la vie de la malade, que risquez-vous à tenter l'infusion de quelque substance dans les veines?

Le Fils de la médecine, autorise cette audace, puisqu'il dit (vol. 1. aph. 6). "Ad plures morbos, et tunc remedia expensis optima".

Within the last few years, Dr. Hale of Boston, has been pronounced this subject, & after having performed a number of experiments, & being fully satisfied that no injurious effects had arisen from them, he determined that he himself would become the subject of his last experiment, & thus to the

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medical world, that opposed to the negative denials, of some  
 he stands as a proof positive, thereby demonstrating incon-  
 testably, that foreign substances, can be introduced into the  
 blood vessels of living animals, & of man himself, with  
 perfect safety.

In the inaugural dissertation of Dr. Robert Wilson, published in  
 the 1<sup>st</sup> number of the Philadelphia Journal of medical & Physical science, giving  
 the following experiments if more are required to convince the  
 skeptical that foreign substances can be introduced into the  
 blood without producing death.

- 1<sup>st</sup> Three grains of Gamboge in a watery solution, produced frequent  
 watery & yellow coloured stools.
- 2<sup>d</sup> 15 grains of Tart. Emetic in half an ounce of warm water produ-  
 ced vomiting in two minutes. In 20 minutes a violent vomiting  
 & purging commenced & in 35 minutes he expired.
- 3<sup>d</sup> Five grains of Gamboge in a watery solution, produced effects similar  
 to those in the first experiment.
- 4<sup>th</sup> Half a grain of Tart. Emetic, produced no uneasiness.
- 5<sup>th</sup> One grain of Tart. Emetic in three drams of warm water, produced vomit-  
 ing after 30 minutes, & several stools.

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35<sup>th</sup> "Injected into the jugular vein of a large Cat, half a dram of Carbonate of Ammonia in half an ounce of warm water. It caused a prostration of strength, accompanied by cries indicating pain. It produced nausea, but no vomiting, she slept during the day, & the next found her as well as usual."

The testimony of all the experimentalists that I have brought forward, leaves not the least possibility of a doubt, that medicines when introduced into the blood, exert their specific action upon the system in a much shorter time than when taken through the medium of the stomach. This being fully established, as it undoubtedly is, & knowing that from the commencement of medical science, we have been authorized by all of the best Physicians to resort to the most active medicines, in our possession, when the milder ones have been used without producing any good effect?

If it can be proved that the medicines, now considered as the most active articles of the materia medica, are in certain diseases, & when taken in the usual way, either wholly inert, or from the length of time required before they produce any effect; the disease has advanced

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so far, that it may be deemed incurable, is it not proper for the physician to resort to the injection of those medicines into the blood vessels, in order that their good effects may be felt by the system at large?

What beneficial effects, has any medicine, heretofore tried had upon Hydrophobia?

It is well known, that Hydrophobia has from the earliest ages, been ranked among the *Opprobria Medicorum* & that it still remains, so. The inefficacy of all the medicines as yet tried, warrants a just conclusion. Now although it is impossible for any one to say, that by resorting to the introduction of any medicine into the veins, it will become as manageable as any other disease; yet I judge it to be equally impossible, to say that it will not.

By one who has, never seen a case of it, & while the list of useless remedies remains, so great, it can not be supposed that the proper remedy, or the precise time at which it should be introduced, can be laid down.

It may be objected to, by some upon the plea, that a sufficient number of trials, has not been made to authorize

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this mode of proceeding. If their objections are well grounded, which from the number of facts produced in this Essay from various authors they cannot be, upon whom would they make these trials. Would they let a human being expire in the most agonizing torments, without making an endeavour to avert the relentless hand of death. Could there be a case, in which a Physician would be more justifiable in resorting to this last expedient, than the one before us? Death must inevitably ensue without it, by resorting to it no one can say what would be the result.

One thing is certain, the event in the case where injecting into the blood, was adopted, could be no worse than in the one where it had not been. That it will be practised at some future period, I have no doubt, & if by this means the life of one human being shall be saved, ought it not to be an inducement for Physicians to proceed, & by following the example of that one who <sup>had</sup> sufficient resolution to throw off the shackles of theoretical notions, endeavour to rescue the list of the opprobrious Misdeed.

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intractable to the remedies, heretofore used?

The remarks made upon the preceding disease apply so justly to this, that it will be unnecessary to enlarge upon them.

Is it not frequently in Croup, a source of great regret, that vomiting can not be produced by any of the usual remedies?

Should a body of any magnitude be lodged in the Oesophagus, & it can neither be pushed into the Stomach, nor can any medicine pass by it, to produce vomiting; nor will the introduction of an Emollient up the rectum act sufficiently promptly to relieve the patient from impeding breath. Under these circumstances the patient must die, & the Physician will have the unpleasant reflection of knowing, that the most powerful & certain remedy was left untried.

When Poison has been taken, the first injunction laid down by all is to vomit, & how often are their endeavors to do this unavailing?

In the three last cases, how beneficially might the injection

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of an emetic into the blood vessels, be resorted to, & how many  
lives could be saved, if the medical world would resolve  
to profit by the experiments already performed, & the facts ascer-  
tained therefrom?

As it has been performed in so many instances, & in the  
greater number of them, the result has proved the propriety  
of it, would not a Physician be very censurable, in neglecting  
or refusing to perform that, which would be the only means  
of saving the life of the patient submitted to his care?

I could proceed still farther, & apply it to the last stages  
of a great variety of diseases, but having applied it to a suf-  
ficient number to shew the importance of ranking it  
among the list of the remedies already in use, I will con-  
clude by wishing that this dissertation may meet with the  
approbation of the medical Professors, to whom it is addressed.

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